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AN OBSERVATIONAL DIARY ON THE NUPTIAL HABITS
OF THE BLACKCOCK (*TETRAO TETRIX*) IN
SCANDINAVIA AND ENGLAND.

BY EDMUND SELOUS.

(Part I. SCANDINAVIA.)

IN the spring of 1907 an opportunity was given me through the kindness of Mr. Biesert, a Swedish gentleman of distinguished political and other attainments, to study the nuptial habits of Blackcocks in the neighbourhood of his wood-pulp manufactory in Wärrmland. Mr. Biesert being absent from home, on account of his health, and the old friend, for some years a member of his household, with whom I had been going to pass the time, having also to leave, through some unforeseen circumstances, I found myself in the novel position of being alone in a handsome and luxurious residence on the borders of a beautiful lake amidst Scandinavian pine-forests, with servants the most obliging and accommodating, in attendance, to whom, however, I was unable to say the shortest sentence except through the *Engelsk-Svensk* volume of a large dictionary, thoughtfully left on the table, which, if it were a question, would be answered, again by means of the *Svensk-Engelsk* portion. On the same basis less the dictionary which was not of portable size, I had also a forester; but Herr Höglind, the courteous and talented manager of the adjoining works, was always at hand through the telephone to

adjust matters whenever, in the way of difficulty, they "grew to a point." With all this, however—the romantic or novelistic part of the story—ornithology has nought to do, and I, therefore, leave it, to come, at once, to the scientific results of my visit—for field natural history is as scientific as astronomy, or any laboratory work.

April 12th, 1907.—This morning, having failed with the Capercaillies, I tried the Blackcocks, getting to the shelter I had put up, a day or two before, some time between three and four. At about 4 there was the angry "whush-ee" note of a Blackcock on the ground, and, shortly afterwards, the musical rookooing one—the "whirble" as I call it—of several from surrounding trees. This continued at intervals till, at about 5, three or four cock birds appeared on the ground, but at a considerable distance from where I sat. Also they kept getting behind a young fir, by which, though it was only some three feet high, and proportionately small, they were yet very much hidden. Still I was able to see most of what went on. The great feature was the spreading out of the tail, by which the curled feathers on either side became a very marked feature, much enhanced by the bunch of white ones between them. The two white spots on the shoulders were also very conspicuous, and beyond all, perhaps, the red comb or sere above the beak. The birds would stand or walk with the tail expanded in this manner, and the head held down except when, at intervals, with a little start and a note that seemed to express sudden impatience they craned it upwards, and sometimes, but by no means always, gave a little leap into the air. A quick succession of such movements on the part of some became a sort of dancing over the ground, in which I recognized, but very faintly, the astonishing performance of which on one occasion only, now some 8 or 9 years ago, I was a witness in Norway. Besides this, some birds faced, and even sparred a little at each other, but it was a very feeble and half-hearted affair, suggesting either that these particular individuals were not good fighters, or—which is perhaps more likely—that the season is as yet too early for the martial spirit to have become properly developed.

April 13th.—Started very early with Jacobsen (the forester), but wasted valuable time in unsuccessful quest of Capercaillies,



and it was only on our return, much later, that we visited the *lek* of the Blackcocks, and, creeping up the rocky ridge bounding it on one side, saw two or three of them on the ground. It was the same thing as yesterday, but even poorer, since it was almost over. Still there was a dance or two over the ground, more particularly of one bird, but if this was intended as a challenge, it was not responded to by any of the others, so that there was not even the semblance of a fight. The running and jumping were, each time, ushered in by a short flight, low over the ground, from the place where the bird had up to then been standing, and with the impetus of this, as it were, the leaping began. It was, I think, accompanied with some angry notes, but if so, they were hardly to be heard, so that the vocal effect produced by the bird I saw in Norway, which hissed and spluttered like an angry cat, was wholly wanting, and the dance itself not comparable in intensity. After a little of this the bird flew into one of the surrounding fir-trees, where it sat making the rough yet musical notes which are as characteristic of these northern fir-forests as is the Wood-Pigeon's cooing of our own woods. It then flew down again, and continued its ground performances for some time longer, and, when it next left, was accompanied by another bird, the two flying from one tree to another, and settling, at length, in closely adjoining ones, where they whirled at one another. In the display of the Blackcock some of the white feathers of the tail are seen above the black ones, even when the bird stands fronting one. There are also *two* white spots, violently conspicuous, on each shoulder, or thereabouts.

What part, if any, is played in all this by the hen bird? As yet I have not seen one anywhere, though probably, had any been about in the open, my glasses would have searched them out. This, however, is quite in keeping with the nuptial doings of the Ruff. She has no doubt yet to make her entry into the drama.

Though unsuccessful in seeing what I wanted to, with the Capercailzies, this morning, yet I had a good view, through the glasses, of one, a hen bird sitting on the very top of a fir-tree, which may be the accustomed perch chosen. The Blackcocks

also fly up into the tops of their trees, if not always into the top bough.

April 15th.—Up at 3 and went with the forester to the Blackcock *lek*, where he left me. I did not go into the shelter, but sat under a small fir-tree on the ridge, which commanded a much better view. From about 4, when it was still dark, the birds were noisy, first the rookling or whirbling note from the trees around the open space, and then, from the ground, apparently, those curious, loud, angry notes, having a sort of wheezing, whishing or sneezing sound in them, intensified sometimes, during the excited "dance," as I have myself heard, before now, into a sort of hiss. The best rendering of the note I can give on paper is "to-whāsh" or "to-whāy." It comes very suddenly and scrapily out of the gloom. Mingled with this I now hear, from time to time, a softer, quite different note, which may possibly be that of the hen; but it is impossible for me to see anything, and this is mere conjecture.

A little before 4.30 there is a pause, both the "to-whāshing" or "to-whāying" note—this last, I think, is nearer—from the ground, and the "rookling" one from the surrounding trees, cease, and with this it becomes gradually light. The place seems entirely deserted, and it is only in the distance, over a wide stretch of country, that I hear the latter occasionally.

The stillness now, at 5, is striking.

It is now 5.15, and, for some time, I have not caught the faintest note of a Blackcock. It seems as though there was a short space of nuptial activity amongst the birds, the first thing in the morning before light, and then, with the coming of daylight, a long pause.

5.25. — The whirbling now in evidence again, but very slightly.

At 5.45 a Blackcock comes sailing, like a Pheasant with spread wings, across the open space, and settles in a fir, just skirting it. He sits there erect, on its very top, his head held well up, as though listening for any impudent rooklings. Now they begin, but far off. He does not answer, and his first note is that angry "to-" or "tir-whāy" which I had connected with the bird being on the ground, but proves now to be independent of situation. Afterwards when three more males sit in firs

skirting the space—two, again, at the very tip-top—it is heard from one or another of them, and now the first-comer begins to rookle continuously. The note is now longer than before, and has a greater volume of sound in it. It is a sort of talking, and begins to sound, after a preliminary “roor” or two, wonderfully like the sentence, “Give him his coppers; he’s going to take the electric.” This may be fanciful, but so I suppose is the constantly repeated remark, or dark allusion, of the “Brain-fever” Bird in India, and having heard the thing once it is impossible not to go on hearing it, with increasing distinctness, every time the sound goes up, which it does continually, or almost so, during a whole hour, till I leave. At long intervals the bird stops to utter the more angry-sounding note, which is the only relief from this distracting hallucination.

At 7.30 no other birds are there, and I go.

April 17th.—Up at 3, and get to the place about 3.40.

First “tir-whāy” note at 3.45, and now come some very loud and striking ones. Then the rookling, and that other and more plaintive-sounding note that I have spoken of. With them all the air is now quite vocal. It is all amongst the belt of trees, however, and probably from amongst their branches. “Choc-choc-kerade,” in soft, complaining, yet resonant tones, represents, fairly well, the plaintive-sounding note.

4.5.—I can now see some birds—at least two in the arena; three or four, as it turns out, for all at once, now, at 4.15, there is a sudden and instantaneous flight of all of them back into the trees.

4.25.—It is now light, and the pause I spoke of, the other day, seems to have commenced. All around the arena silence reigns.

At 5.30 three birds, and then another one, fly down into the arena. They stand, or make a step or two, spreading out their tails, as described, and then two approach each other, uttering that note which I have called the plaintive one—very soft and plaintive-sounding it is—and conjectured might belong to the hen, but which would now seem to be the note of war *par excellence*. Once or twice the birds approach in this manner, but the utmost they do is to make a slight feint at one another. Then, all at once, all four—for there are not more—rise and fly into

the trees. From these rookling now proceeds, and the "Give him his coppers; he's going to take the electric" is as apparent as ever. It seems likely, therefore, that when I heard all these notes in the darkness the other morning some of the birds, at any rate, were in the arena, though it being, perhaps, a little darker then, I did not see them. Whilst still dark it is a good deal warmer than at and after daybreak, and whether for this reason or that the sexual stimulus is not yet fully developed, the birds seem shy, as yet, of remaining for long on the ground—certainly shyer than some days ago, when the weather was finer and warmer. These last two mornings—Monday and Wednesday—there has not been any of that darting and flying about over the ground, and springing into the air, that, though little compared to the tremendous "dance" which I *once* saw in Norway, in May, has yet been the most noticeable feature of these present nuptial performances. The difference between the earlier and later form of this sexual whirlwind, as it may be called—between the breeze and the whirlwind—is very great, insomuch that one would hardly at first, or without the evolutionary habit of thought, suppose that the one could have passed into the other. Nevertheless, the last is merely the first intensified, or, at any rate, if one imagines a constant addition, can very well be seen in this light.

In speculating on the meaning of this frenzy, as at its height it may be well called—indeed it then beggars description—of the Blackcock, its probable course of development must be considered. At first, as shown by my observations of the 12th and 13th, the actions indulged in are no more than slight exaggerations of ordinary flying and running about over the ground. There is little or nothing suggesting some special object to which they are adapted. They seem the outcome of general excitement, or, speaking more accurately, the more or less generalised outcome of a special kind of excitement, which we must hold to be the sexual kind, since, though the sexual instinct may be the greatest provocative of the combative one, we cannot identify it with this, but must suppose it to be anterior to and producing the other, as a consequence of itself. All creatures, whether combative or not, become thus excited during the pairing-time, such excitement standing, as I suppose, in direct connection

with the physiological development proper to the season. I would consider, therefore, that these violent motions are, in their incipency, at any rate, sexual rather than combative, to whatever end and object they may have been ultimately shaped, whether to that of terrifying rival males by a warlike display, or rousing the amatory feelings of the hen by a courting one. Also, should evidence of any more special end be wanting (end is perhaps the better word, as not implying consciousness), the benefiting of the bird through mere violent activity—erotic athletics one might call it—would be a quite sufficient one.

Observation is the only path by which we can arrive at true notions in regard to all this. At present I have observed that the birds, when they have seemed most like fighting, when they have most made believe of it as I may say—for of true fighting there has been as yet nothing—have sometimes, at any rate, if not always, approached and thus feinted, without any previous display of this sort—at least that seemed to stand in any immediate connection with it. This was certainly the case, this morning, when there was a little of this advancing, confronting, and half-hearted threatening—only a very little certainly—but not any previous saltatory movements. Probably Blackcocks sometimes quarrel and fight out of the breeding-season. It would be interesting to observe whether they then indulge in these antics. If not, they are, probably, not of the war-dance order. The same argument might even be applied in the case of a quarrel with another species, since if such actions, whatever their origin, have now become fighting ones, or such as usher in fighting, then fighting at any time and for any reason ought, one would think, to produce them. Thus male Stone Curlews, when threatening one another in the spring-time, fan the tail very effectively—which I look upon as essentially a sexual display. I have, however, seen one of these birds—when the two species were intermingled over a sandy area—make a rush at a Pheasant, who fled most ignobly, and the tail was not then fanned. Surely if the action had been evolved along lines of intimidation it would have become so essential a point in combat that it could never be dropped. So much then, for the present, in regard to the war-dance or challenging theory of these actions. As to that of sexual display, the hens have not yet put in an

appearance, which, however, is far from conclusive against it, since not merely association of ideas, in rivalry, but the season itself, without their presence, would be sufficient to produce them.

In the evening I questioned the forester, through the interpretership of Herr Höglind, in regard to certain statements which I had dimly understood him to make, as to certain winter habits of the Blackcocks here—to wit, their burrowing in the snow and eating their own excrements. From finding so many little collections of these in the forest—the whole country is either lake or forest, with open spaces of rock, moor, or peat-hag—I had surmised that it was the habit of the birds to void them in one spot, either coming to it singly, or at different times, or else collectively, for, from such heaps being frequently found in the open, they could not be accounted for as having fallen from their roosting-trees. Jacobsen, however, says that such collections are made by one and the same bird that has burrowed down in the snow and remained there for several days, or even weeks, if I understood him correctly—or say a week or ten days—eating their excrements many times over. He says that hard weather and scarcity of food oblige them to do this, and that it is their regular habit. Asked if several birds might not burrow in the snow together, like this, and the number of excrements be thus accounted for, and if they did not go together in winter, he said that they did go together, but that each one would make its own hole in the snow, so that there would be one here and another there, close together perhaps, but not united—a sort of Blackcock warren in the snow, it would seem. It seems to me possible, however, that though each bird makes its own separate hole in the snow, which indeed one would expect, yet that several may come together under it and stay thus for the sake of warmth. Yet even thus they would occupy some space, and it would, in fact, be impossible for such compact heaps as I have found to be produced by more than one bird, unless they had a special habit of voiding their excrements in one particular spot—and this seems highly improbable. I do not, however, see how the fact of the birds eating their excrements, as a means of nourishment, is made out, since Jacobsen did not profess to have actually seen them do so, which would have been difficult under

the circumstances. Not that the thing seems unlikely in itself, but since excrements are supposed to be the waste products of food, how should the birds be nourished by them, many times in succession? Moreover, the explanation would seem to be destructive of the phenomenon to be explained. Such heaps, however, certainly seem the products of a considerable space of time, and if the bird is all that time in the one spot, under the snow, which is what Jacobsen says, how is it nourished? As Jacobsen has passed his whole life in these forests, his father having been forester (the equivalent here of gamekeeper, or rather game-getter) before him, he may be supposed to have intimate knowledge of the bird's habits. The Capercailzie, he says, does not burrow in the snow, its food consisting entirely of pine-needles, so that it would never be driven to do so. In explanation of a large heap of over a hundred droppings of this bird under a tree, he said it would be from the same one roosting always on the same branch. To me it seems more likely that the Blackcock burrows under the snow to get food. But to do this it would have to move about, and, here again, these compact heaps of droppings seem rather curious.

April 18th.—To-day, unfortunately, was a blank, for having arranged with the forester not to call me any more, since I could now find my way to the *lek* alone, even in the dark, I overslept myself.

April 19th.—Called by the night watchman at 2.30, and started shortly after 3, getting to the ridge from which I watch in the first twilight of dawn. It is night, however, in the dark forest, and, as yet, silence. Then, just as I get settled and composed, in my rugs, comes the first almost sleepy "tir-whāy," then a pause, and another—still sleepy—and then several others no longer so, and now I hear the flight of a bird or two down, as I think, into the arena, where I seem for a moment, amongst the shadows, to distinguish one black form. Then comes the first imperfect whirlbe with another or two in the distance, whilst the "tir-whāying" increases, though with fluctuations.

Another near rookle. I can take no note of the hour, my watch (price 7s. 6d.) having become incapacitated for the second time. I have hardly been here ten minutes, however.

Some loud, fierce-sounding "tir-whāys," whilst the full

rookle—"give him his coppers, &c."—sounds now here and there. I can make out no birds, but from the sounds, some seem to be down, and might even be fighting. Very loud, harsh and fierce, now, are the "tir-whāys" (or "choc-heys"), and a white tail or two, as I think, gleams for a moment through the mist and frost of the bog—for it is in a part of a large swampy "peat-hag" or "moss"—which is the Swedish word—only just crossable, that the birds gather or should gather. I can see one now, clearly, and then the black body—blacker than night—whilst, from the sounds, birds seem to be flying and leaping, here and there, over the ground. The only one, however, that I can see distinctly, and keep in view, seems to be pretty quiet. Rookling comes all round about, now, as light slowly struggles out of the darkness. Before this, too, I have heard the plaintive-sounding, but really bellicose, "choc-choc-kerada" note. Now, however, when morning has really come, I can make out no birds.

Yes, one now—a coal-black blot. But the early pause has come, and there are none on the arena. Frost is over moss, grass, and bog-heather, and amidst the sombre green of the fir-trees the slender white stems of the birches—here mere saplings—slash the air in innumerable perpendicular cuts. All the sky to the westward is now a deep, dusky blue—almost purple—whilst slowly, from the eastern horizon, a brightness begins to climb. The silence and still beauty of the scene is impressive, and one might think that the birds were impressed with it, since, for a considerable time, now, there has not been a note of one.

Now, after a long interval, and in broad daylight—though the sun has not yet topped the firs, only fired them a little—the whirling recommences, having been preceded by the harsher note.

A hen bird now flies down into the arena, and is courted first by one and then another cock that I had not seen before. She alights at some distance from either, and one comes over to her some time before the other. He courts her much in the way of the common Pheasant, passing by her, first on one side and then the other, and, as he does so, tilts his whole body sideways and downwards, towards her, so that she gets a near view of its

whole upper surface, the upper part of the farther side* (owing to the tilt) and the whole nearer side, consisting principally of the carefully drooped and spread wing. There is also the crimson-combed head, held down, with the swelled, glossy neck for her inspection, and of course the ornate tail. Thus poised, as it were, the bird passes in front of her, coming from behind, and then round on the other side, when he turns and repeats, and it is noticeable that the part wanting to complete the full circle is where, if he were to make it, he would pass directly behind her. Thus she gets as much of all the decorated parts as it is possible for her to do in a single *coup d'œil*—the tail, if I mistake not, being also tilted, so that the whole Cupid's bow of it is visible. The thick white feathers behind it do not seem so capable of being shown in this posture. A considerable portion of their ends, however, project over the black arch—or between the double arch—of the tail, and the rest must also be conspicuous, at least in flashes, and particularly when the cock passes in front of the hen, before turning to repeat his display on the other side. She has then a full view. Now when cock birds face one another, to fight, and when they strut, or face, or turn, by themselves, the tail is fanned, the wings lowered, and the head, though sometimes lowered, generally held erect. But this particular tilt of the body, as also a certain pace and look, which belong to it, is entirely wanting. This is most significant, for the object of the tilt is unmistakable, and demands the presence of the hen. Also it is to the female alone that one wing only—that nearest her—is presented and spread in a very particular way.

The hen bird seems by no means unalive to these attentions, which, however, may be not now so ardent as they probably become later on. Her manner is very conscious, and she has almost a nervous look. She does not, however, yield to them, but walks forward in a series of little starts, with pauses between. After a while the other (or another) cock comes up, and the two court her, in the above-described way, one on each side, but I again notice that the courtship does not seem very ardent, nor do the cocks, though they have made a show of fighting before,

* This seems to me now a little doubtful, though I have it on my notes (like Justice Stareleigh). It is unimportant—the bird shows quite enough.

show any signs of doing so now. The hen passes on, and after awhile flies into the surrounding fir-belt, and now that she is gone the two cocks again advance against each other, and there are the beginnings of a half-hearted fight between them. Thus the presence of the hen, on this occasion, has not brought about a combat, but rather diverted it. It is the very same observation which I have made, day after day, in the case of the Ruffs, whilst these were in the very height of the sexual frenzy. It is, in fact, obvious that if male birds assemble specially to court the hens, fighting must interfere with this object, so that if the courting is really the more important matter of the two, we might expect it to become gradually weaker, and, as it were, broken up, in birds which have developed these habits. On the other hand, if fighting, rather than courting, were the object of such assemblies, it is strange that ordinary observation gives quite a contrary idea. According to their relative importance, the one element, as it seems to me, must be weakened by the other, so that by what we see, in the presence of the hen, we may judge of such relative importance.

This is not the only hen that has appeared this morning. Another has sat on a baby fir within the arena, with a cock beside her on another one, whilst several others have flown over the ground and come down in the trees that encircle it. A greater number of cocks, too, than I have before seen have swept from this tree to that, whilst some half-dozen, perhaps, have come down upon the place, or sat in small firs close upon it, two of the former rookling continually. During this rookling the head is lowered, and the feathers of the neck swell and move. Then, with a sort of start, the bird raises its head, gives a little jerk of the wings, and stretching upwards, utters the fierce "choc-kai" note. There have been some little runs over the ground, but not very vigorous, and the leaping off it has been almost, if not quite, wanting. It was entirely wanting in the presence of the hen, forming no part of the display. All this last has been in the bright sunshine, which floods now both trees and arena. It is, however, most bitterly cold, and I can sit still no longer. But all, I think, is over for this morning.

The birds, therefore, are obviously in a more coming-on

disposition than they were, either the day before yesterday or any morning since I came, before it, nor is it likely that they were more forward before I came, since it is evident now, as I feared, and as is confirmed by Jacobsen, that I have come too early. Were it not for my oversleeping myself yesterday, I might almost say positively that this has been the first appearance of the hen upon the scene ; yet, even now, only one has actually come down into the arena. In all, perhaps, some half a dozen cock birds entered it, but never all at the same time—four, I think, was the limit, exclusive of the one hen. When one or other of the cocks advanced towards another, to fight—or, at any rate, with this thought in its mind—it would make a sort of elastic quick step—hardly or only just a run—but not those remarkable leaps into the air, even as I have seen them made here, much less as I have in Norway (only, however, as I have before said, on one occasion). The war-dance—to call it so, for convenience sake—seems a special feature, which, as yet, has hardly come into play. I cannot say, as yet, therefore, whether it has more to do with fighting or courting.

(To be continued.)

ROUGH NOTES ON THE FISH AND FISHERIES OF EAST SUFFOLK.

By ARTHUR H. PATTERSON.

(Continued from p. 392.)

LIST OF EAST SUFFOLK FISHES.

THREE-SPINED STICKLEBACK (*Gasterosteus aculeatus*).—It is safe to state that this species in its several varieties is plentifully distributed in all the ponds and ditches in the county. I found near Lowestoft examples of the Rough-tailed (*G. trachurus*) and Quarter-armed (*G. gymnurus*).

TEN-SPINED STICKLEBACK (*G. pungitius*).—I have found this in company with the Three-spined, in ditches bordering on the Waveney. Mr. C. W. Long informs me it is found in ditches near Oulton, and also in the Ham, between Lowestoft and Oulton Broad.

FIFTEEN-SPINED STICKLEBACK (*G. spinachia*).—Said to have been taken in the estuary of the Alde.

PERCH (*Perca fluviatilis*).—Much has been written of "the bold-biting Perch" as an inhabitant of Suffolk waters. Browne* makes reference:—"Perca or Pearch great & small. Whereof such as are in Braden on this side Yarmouth in the mixed water make a dish very daintie & I think scarce to bee bettered in England." Lubbock† referred to the species (1848) as plentiful in the Bure and Waveney. He cites St. Olave's as a "celebrated station for anglers," where, "if Shrimps are up as high as the bridge, it is generally found that Perch are there also." The favourite bait used by anglers was the Ditch Prawn (*Palæmon varians*), which abounds in the brackish marshland ditches. To-day St. Olave's would be the last place chosen for Perch-fishing,

* 'Natural History of Norfolk,' by Sir Thos. Browne. Edited by the late T. Southwell, p. 52. 1902.

† 'Observations on Fauna of Norfolk,' by Richard Lubbock. Second edition, with notes and additions, by the late T. Southwell, p. 191. 1879.

although Bream and Roach are still occasionally to be taken on the neap-tides. The deepening of Yarmouth Harbour has "let in" so much more salt tide, which pushes up the rivers sometimes to an alarming extent. Christophner Davies* gives an account of a Perch taken in the "new cut" (between Haddiscoe and Reedham), weighing 7 lb. (!); and of a barber in Beccles who had captured "eleven Perch, weighing 2 lb. each, in one spot, in a couple of hours, using Gudgeon as bait." One is recorded as taken at Geldeston Lock, of 4 lb. weight.

AMERICAN ROSE PERCH (*Scorpaena dactyloptera*).—On April 24th, 1894, I obtained what I believe to have been the first of this species taken off the East Coast. It was captured in a Shrimp-net; length, $5\frac{3}{4}$ in. An 8 in. example came to me from Lowestoft, on Dec. 11th, 1895; and yet another was sent me by Mr. F. C. Cook in the spring of the present year (1909).

BASS (*Labrax lupus*).—Locally known as "Sea-Perch," this species is by no means rare off the Suffolk coast. Wake, of Southwold, curiously enough, omits it. Several have been captured off Claremont Pier, Lowestoft (Robson). Mr. Clarke, of Aldeburgh, had known one netted there weighing 18 lb., and one taken on a rod in August, 1906, scaling $16\frac{3}{4}$ lb. This fish is rarely taken off Yarmouth, and then runs of very small size. Mr. Whistler, of Aldeburgh, assures me that spinning for Bass provides excellent sport in the estuary of the Alde.

[BLACK BASS (*Micropterus salmonoides*).—An introduced species, which did not flourish; had it done so I think anglers would have very soon desired the extirpation of so voracious a fish.]

RUFFE (*Acerina vulgaris*).—Plentifully found in Fritton Lake, giving anglers who fish in shallows considerable trouble by its persistently taking the baits. The wisest thing to do when discovered by it is to shift to another spot as soon as possible.

SURMULLET (*Mullus surmuletus*).—Mostly taken among Mackerel. Mr. Howard Bunn states that "very fine specimens are taken [Lowestoft], and at times very plentifully."

SEA-BREAM (*Pagellus centrodontus*).—"Once or twice I have seen this on the [Lowestoft] market" (W. A. Dutt). Mr. Howard Bunn states that examples up to 4 lb. are brought in.

* 'Norfolk Broads and Rivers,' new edition, p. 21. 1884.

GILTHEAD (*Chrysophrys aurata*).—An accidental visitor. One is recorded from Pakefield, near Lowestoft, in April, 1829. This fish is named the "Gilthead" because of the brilliant golden spot or crescent between the eyes.

MILLER'S THUMB (*Cottus gobio*).—Mr. Dutt informs me that, when a boy, he used to catch Miller's Thumbs in a "beck" connected with the Waveney at Ditchingham, near Bungay. Mr. C. W. Long assures me there are a goodly number of this species to be found at Beccles.

FATHER-LASHER (*C. scorpius*).—Taken in Shrimp-nets, and known at Lowestoft and at Aldeburgh as the "Bull-rout." This large-headed, spine-armoured species (which is nicknamed at Yarmouth the "Hummer") Dr. Day ('British Fishes') suggests is "a degenerated variety of the Greenland Bull-head." Very beautifully coloured examples of *Cottus grœnlandicus* are occasionally brought into Yarmouth by the shrimpers. It undoubtedly extends its range further south.

BUBALIS (*C. bubalis*).—Occasionally brought into Yarmouth by shrimpers fishing between the port and Corton. It does not run so large as the preceding, from which it is easily distinguished by the very long spines upon the gill-covers.

FOUR-HORNED COTTUS (*C. quadricornis*).—On March 3rd, 1907, I received three examples of this species, the longest measuring $8\frac{1}{2}$ in., from the neighbourhood of Lowestoft.* I have since seen one taken off a pier at Yarmouth. The *Cottidæ* are distinguished by their bulky heads and the fan-like spread of the pectoral fins.

RED GURNARD (*Trigla cuculus*).—Small ones occasionally taken off Lowestoft with Shrimps. I saw one there on August 30th, about 8 in. in length, thrown out with the refuse from a Shrimp-boat. Southwold (Wake).

TUB-FISH (*T. hirundo*).—Fine examples brought to the Lowestoft wharf in May and June from the deep seas. Mr. Whistler informs me it has been taken off Aldeburgh. Locally known as the "Latchet."

STREAKED GURNARD (*T. lineatus*).—An example of this short-nosed Gurnard, taken off Lowestoft on March 9th, 1896, came into my hands.

* Cf. 'Zoologist,' 1907, p. 461.

POGGE (*Agonus cataphractus*).—Sir Thomas Browne calls it: "A little corticated fish about 3 or 4 inches long ours answering that wch is named piscis octangularis by Wormius, cataphractus by Schoneueideus. Octagonis versus caput, versus caudam hexagonius." "A MS. note in Berkenhout says it was called at Lowestoft a Beetle-head (1769)" (T. Southwell). Abundant along the east coasts. I found numerous examples at Southwold among "refuse," and many small ones at Aldeburgh, Sept. 1st (1909). This queer little fish is entirely encased in bony plates.

GREATER WEEVER (*Trachinus draco*).—Common enough on Lowestoft wharf among "offal." An example taken on a hook off Claremont Pier (Robson). Referring to the poisonous properties of its first dorsal fin, Sir Thomas Browne says: "If the fishermens hands bee touched or scrached with this venemous fish they grow paynful and swell." This detested although toothsome fish is still notorious for its dangerous properties, while seine- and deep-sea fishermen still cautiously approach it when freshly shot out of the nets.

LESSER WEEVER (*T. vipera*).—Taken in shallow waters abundantly along the Suffolk coast. When strolling by the bank of the Blyth, at Walberswick, in company with Mr. Percival Westell, on August 4th, 1909, we came across quite a small heap of these fishes that had evidently been flung out of a boat, or had been, as he suggested, hooked by some urchin. Numbers are taken off Gorleston in draw-nets. On August 26th, 1909, I saw some visitors' children playing "fish-shops" with quite thirty of these fish, some of unusual size; they were handling them with impunity. Yarmouth smelters show the utmost disgust with this species, and are very careful not to handle it. At Southwold (Wake).

MAIGRE (*Sciaena aquila*).—A fine specimen of this noble fish, a straggler undoubtedly from the Mediterranean, where it is well known, was cast ashore at Thorpe, near Aldeburgh, on August 30th, 1868; length, 5 ft.; weight, 84 lb. The man who secured it thought it was a monster Bass, a fish it somewhat resembles, the spiny-rayed first dorsal fin much resembling that of the commoner fish. The tail, however, is truncated or rounded, that of the Bass being concave or forked. Two others

are recorded for the Norfolk coast, as having been taken in the Herring-nets.

MACKEREL (*Scomber scomber*).—"Scombri are mackerells in greate plentie," says Sir Thomas Browne, "though . . . a common fish yet our seas afford sometimes large & strange ones as I have heard from fishermen & others. & this yeare 1668 one was taken at Lestoffe an ell long by measure & presented to a Gentleman friend of myne." This must have been either a Tunny or a Bonito (3 ft. 9 in.!). The largest Mackerel I have ever seen was one taken off Yarmouth on October 21st, 1898; weight, 3 lb. 7 oz.; length, $21\frac{1}{4}$ in.; girth, 12 in.

[**SCRIBBLED MACKEREL** (*S. scriptus*).—This by some authorities is referred to as a variety of *S. scomber*. Occasionally found at Lowestoft among the preceding. There chance-time is found among the Mackerel a variety (*concolor*), blue-backed, but entirely without the familiar stripings.]

TUNNY (*S. thynnus*).—This is the species that Browne (see Mackerel) referred to. The Pagets* mention "small specimens [as] not infrequently taken during the Mackerel fishery." In Lowe's 'Notes' is a record from Mr. Gurney as follows:—"An immature specimen, taken off the Suffolk coast near Southwold, I believe, is preserved in the Norwich Museum" (Nor. N. S.).

PILOT FISH (*Naucrates ductor*).—The late Mr. J. H. Gurney (Nor. N. S.) says:—"Many years ago I saw a specimen freshly caught off the Suffolk coast, and sent for preservation to the late Mr. J. Tims, of Norwich, in whose house it was unfortunately destroyed by a fire on the premises."

DORY (*Zeus faber*).—"The local trawlers catch an occasional John Dory at Southwold" (R. J. Canova). "Occasionally in the Aldeburgh trawls" (Whistler). Is in no repute in East Anglia for the table.

BOAR-FISH (*Capros aper*).—Mr. T. E. Gunn, of Norwich, in his 'Catalogue of Fishes,' exhibiting at the Great International Fisheries Exhibition in London, 1883, refers to an example which was "caught off Lowestoft in May, 1881." I have seen only two—one taken in a Shrimp-net the same year; the other was washed up on the beach in May, 1882.

* 'Sketch of the Natural History of Great Yarmouth,' by C. J. and James Paget. 1834.

SCAD (*Trachurus trachurus*). — "Frequent off Lowestoft" (J. H. Gurney in Nor. N. S.). "Has been taken off Claremont Pier, Lowestoft" (Robson). "Not so frequent off Aldeburgh" (Whistler). "Before the herrings there comonly cometh a fish," says Sir Thomas Browne, "about a foot long, by the fishermen called an horse . . . of a mixed shape between a mackerell & an herring." It is known generally as the "Horse-Mackerel."

SWORD-FISH (*Xiphias gladius*). — One brought into Lowestoft on Sept. 27th, 1893. Length, 9 ft. It had been entangled in a Herring-net. Another landed there, Sept. 27th, 1897. I understand that one was also recorded in November, 1882.

LITTLE GOBY (*Gobius minutus*). This tiny fish frequents the estuaries all along the Suffolk coast. Haunts muddy resorts.

YELLOW-SPECKLED GOBY (*G. auratus*). — Preferring a sandy habitat, this species abounds off the eastern coasts. I found examples in the Southwold and Lowestoft boats.

WHITE GOBY (*Latrunculus albus*). — I found one specimen in a Southwold boat in June, 1906. [I have six Gobies on my Yarmouth list, and am convinced that they all would be found off the Suffolk coast if carefully looked for.]

YELLOW SKULPIN (*Callionymus lyra*). — Abundant off Gorleston. I saw several at Lowestoft, August, 1909, in the Shrimp-catches.

LUMPSUCKER (*Cyclopterus lumpus*). — "By some esteemed a festiuall dish though it affordeth butt a glutinous jellie & the skin is beset with stony knobs after no certain order" (Browne). On Mr. Gunn's 'Fish List' he refers to a fine example caught off Lowestoft on Jan. 30th, 1882; weight, $11\frac{3}{4}$ lb.; length, $20\frac{1}{4}$ in.; girth, 26 in. The roe was developed and contained thousands of eggs. Mr. Howard Bunn assures me that he has had this fish "in all colours," and up to 28 lb. in weight. I have seen numerous young ones taken by the Shrimp-boats in spring the size of walnuts, which they much resemble in shape, of a rich emerald-green colour. Hele, in 'Notes about Aldeburgh,' mentions "an enormous specimen, weighing over fifteen pounds," captured off that place, March 15th, 1868. Length, $22\frac{1}{2}$ in. "Occasionally at Aldeburgh in trawl-nets" (Whistler). Southwold (Wake).

SEA-SNAIL (*Liparis vulgaris*). — Abundant all along the East Coast. I found it plentiful among the "refuse" on Southwold

beach, and at Aldeburgh. Several at Lowestoft (August, 1909). This species is variously striped and marbled.

MONTAGU'S SUCKER (*L. montagu*).—I found two at Southwold, August, 1909.

ANGLER (*Lophius piscatorius*).—On the authority of the late Mr. T. Southwell, quite a number of this species were captured in the Mackerel-nets of Lowestoft in the autumn of 1897, a most unusual circumstance, I should consider, for such a sluggish, clumsy, ground-loving species. Mr. Dutt has seen examples at Lowestoft. "Fishing-Frog," Southwold (Wake).

WOLF-FISH (*Anarrichas lupus*).—"Catfish." Mr. Dutt mentions seeing several on the Lowestoft fish-market. This species, filleted and smoked, and made bright yellow with anatto, has of late years come into favour, and is sold as "Grimsby Haddock." The flesh is excellent eating, but not in much request, except under the disguise of smoked fish, or when fried at the fish-shop, where questions are seldom asked.

BUTTER-FISH (*Centronotus gunnellus*).—Known as "Nine Eyes," from the spots on the extended dorsal fin, and also as the Spotted Gunnel, this species is a common capture off Gorleston. I failed however, although carefully searching for it, to find it at either Aldeburgh or Southwold. A fine example brought me from a Lowestoft Shrimp-boat, September 9th, 1909, by Mr. F. C. Cook.

VIVIPAROUS BLENNY (*Zoarces viviparus*).—Common. Has been taken off Claremont Pier, Lowestoft. I saw a fine one netted in the Herring-basin, August 30th, 1909. "Caught at Aldeburgh" (Whistler). Breeds on this coast.

ATHERINE (*Atherina presbyter*).—This beautiful little fish seems to be remarkably abundant in all the Lowestoft basins throughout the summer months. It is most industriously angled for by young and old, and is known as the "Silver Smelt." "Occasionally at Aldeburgh" (Whistler).


GREY MULLET (*Mugil capito*).—This species used to swarm up Breydon fifty years since, and was common twenty-five years ago; thence it found its way up the Waveney and other local rivers, showing up in numbers in Oulton Broad. Col. Leathes ('Rough Notes') refers to a plan that was successful in its capture. Two men would row over the Broad, one holding a

light barbed spear, which he would adroitly throw into a shoal of Mullet, "success very often attending the cast." He was not smitten with the fish's edible qualities. Numerous at times at Aldeburgh, where it has been known to attain a weight of $9\frac{3}{4}$ lb. A nine-pound example is my largest recorded fish for Great Yarmouth. Southwold (Wake). Mr. Gurney writes:—"I have seen some fine specimens taken on the Suffolk coast, at the mouth of the River Orwell" (Nor. N. S.).

[LESSER GREY MULLET (*M. chelo*).—On November 10th, 1890, an example of this little-known species was foully hooked on Breydon. Length, $7\frac{1}{2}$ in. Dr. Günther identified it as a variety known as *M. septentrionalis*. I have no doubt this example was not alone, but that in all probability it (with its companions) was making for the waters of the Waveney.]

BALLAN WRASSE (*Labrus maculatus*).—"A young one, about eight inches long, was taken with hook and line in the outer harbour of Lowestoft in August, 1852"—"J. H. G." in Lowe's 'Notes' (Nor. N. S.). Mr. Howard Bunn has had several examples in for preservation. [The Jago's Goldsinny (*Ctenolabrus rupestris*) has on several occasions been brought to me by Yarmouth shrimpers during the past three summers. I cannot positively describe this as a Suffolk species, although the boats fish often as far south as Corton, and in all probability one or two, if not more, may have been taken off the Suffolk coast. It would be interesting to look for this fish, which grows to a span in length, is of a lively, almost goldfish-red when freshly taken, with decided black spottings on the base of the tail and on the anterior part of the dorsal fin. Other Wrasses undoubtedly occur.] The *Labridæ* are widely distributed in British waters, preferring rocky haunts. They run to a considerable size, and by some are adjudged good eating. The flesh to me is soft and glutinous, with the bones over-much pronounced. Their colours are brilliant, especially during the breeding season.

(To be continued.)



CHECK-LIST OF THE GENERIC NAMES OF LEECHES, WITH THEIR TYPE SPECIES.

BY ROBERT T. LEIPER, M.B., F.Z.S.

Helminthologist to the London School of Tropical Medicine.

- Abranchus*, Johannson, 1896. Type: *A. brunneus*, Johannson, 1896.
- Acanthobdella*, Grube, 1850. *Type: *A. peledina*, Grube, 1850.
- Actinobdella*, Moore, 1901. *Type: *A. insquianmulata*, Moore, 1901.
- Adenobdella*, Leidy, 1885. Type: *A. oricola*, Leidy, 1885.
- Albione*, Savigny, 1820. Type: *A. muricata*, Linnæus, 1767.
- Archeobdella*. (Original not found.)
- Astacobdella*, Vallot, 1840. Type: *A. branchialis*, Vallot, 1840.
- Aulastoma*, Moquin-Tandon, 1826. *Type: *A. nigrescens*, Moquin-Tandon, 1826.
- Batrachcobdella*, Viguier, 1879. *Type: *B. latastei*, Viguier, 1879.
- Bdella*, Savigny, 1820. (*Type: *Hirudo nilotica*, Savigny, 1820), preocc. 1795.
- Blennobdella*, E. Blanchard, 1849. *Type: *B. depressa*, E. Blanchard, 1849.
- Branchellion*, Savigny, 1820. *Type: *B. torpedinis*, Savigny, 1820.
- Branchiobdella*, Odier, 1823. *Type: *B. astaci*, Müller, 1806.
- Calliobdella*, v. Beneden et Hesse, 1863. Type: ? *C. lophii*, v. Beneden et Hesse, 1863.
- Centropygus*, Grube, 1858. *Type: *C. jocensis*, Grube, 1858.
- Chthonobdella*, Grube, 1865. *Type: *Hirudo limbata*, Grube, 1865.
- Clepsine*, Savigny, 1820. Type: *Hirudo bioculata*, Bergmann, 1757.
- Codonobdella*, Grube, 1872. Type: *C. truncata*, Grube, 1872.
- Cyclicobdella*, Grube, 1871. Type: *C. lumbricoides*, Grube, 1871.
- Cyclobdella*, Wegenbergh, 1877. Type: *C. glabra*, Wegenbergh, 1877.
- Cystobranchus*, Diesing, 1859. ? Type: *C. respirans*, Troschel, 1850.

* Type, only species originally in the genus.

† Type, designated.

- Dactylobdella*, v. Beneden et Hesse, 1864. *Type: *D. musteli* v. Beneden et Hesse, 1864.
- Dermobdella*, Philippi, 1867. Type: *D. purpurea*, Philippi, 1867.
- Diestecostoma*, Vaillant, 1890. Type: *D. mexicana*, Baird, 1869 (for *Heterobdella*, Baird).
- Dina*, R. Blanchard, 1892. †Type: *D. quadristriata*, Grube.
- Dineta*, Goddard, 1908. *Type: *D. cylindrica*, Goddard, 1908.
- Diplobdella*, Moore, 1900. *Type: *D. antellarum*, Moore, 1900.
- Entobdella* Blainville. (Original not found.)
- Epibdella*, Blainville, 1828. Type: *Hirudo hippoglossi*, Linnæus, 1767.
- Erpobdella*, Blainville, 1828. Type: *Hirudo vulgaris*, Linnæus, 1767.
- Eubbranchella*, Baird, 1869. Type: *Hirudo branchiata*, Menzies, 1791.
- Geobdella*, Blainville, 1828. Type: *Trocheta viridis*, Dutrochet, 1817.
- Geobdella*, Whitman, 1886 (preocc. 1828).
- Glossiphonia*, Johnson, 1816. Type: *G. tuberculata*, Johnson, 1816.
- Glossobdella*, Blainville, 1828. Type: *Hirudo complanata*, Linnæus, 1767.
- Glossopora*, Johnson, 1825, nomen novum for *Glossiphonia*.
- Gnatho*, Goldfuss et Schinz, 1828. Type: *Hirudo piscium*, Müller, 1774.
- Gyrocotyle*, Diesing, 1850. Type: *G. rugosa*, Diesing, 1850.
- Hæmadipsa*, Tennent, 1860. Type: *H. ceylanica*, Bosc., 1802.
- Hæmentaria*, Filippi, 1849. Type: *H. ghilianii*, Philippi, 1849.
- Hæmocharis*, Savigny, 1820. Type: *Hirudo piscium*, Müller, 1774.
- Hæmopis*, Savigny, 1820. Type: *Hirudo sanguisuga*, Linnæus, 1767.
- Helobdella*, Blanchard, 1896. †Type: *Hirudo stagnalis*, Linnæus, 1767.
- Heluo*, Oken, 1815. (Type: *Hirudo complanata*, Müller), preocc. 1813.
- Hemibdella*, v. Beneden et Hesse, 1863. *Type: *H. soleæ*, v. Beneden et Hesse, 1863.
- Hemiclepsis*, Vejdovsky, 1883. †Type: *Hirudo marginata*, Müller, 1774.
- Herpobdella*, vide *Erpobdella*.
- Heterobdella*, v. Beneden et Hesse, 1863. Type: *H. pallida*, v. Beneden et Hesse, 1863.

- Heterobdella*, Baird, 1869. (Type: *H. mexicana*), preocc. 1863.
Hexabdella, Verrill, 1872. *Type: *H. depressa*, Verrill, 1872.
Hippobdella, Blainville, 1828. Type: *Hæmopsis sanguisorba*, Savigny, 1820.
Hirudella, Munster, 1842. Type: *H. angusta* or *H. tenuis*, Munster, 1842 (doubtful fossil).
Hirudinaria, Whitman, 1886. Type: *Hirudo javanica*, Wahlberg, 1855.
Hirudo, Linnæus, 1767. Type: *Hirudo medicinalis*, Linnæus, 1767.
Histriobdella, v. Beneden, 1858. *Type: *H. homari*, v. Beneden, 1858.
Hybodbella, Wegenberg, 1877. Type: *H. doringii*, Wegenberg, 1877.
Ichthiobdella, Blainville, 1827. Type: *I. geometra*, Blainville, 1827.
Jatrobella, Blainville, 1828. Type: *Hirudo medicinalis*, Linnæus, 1767.
Leptostoma, Whitman, 1886. (Type: *L. pigrum*, Whitman, 1886), preocc. 1837.
Limnatis, Moquin-Tandon, 1827. Type: *Hirudo nilotica*, Savigny, 1820.
Limnobdella, Blanchard, 1893. †Type: *L. mexicana*, Blanchard, 1893.
Liostomum, Wagler, 1831. *Type: *L. coccineum*, Wagler, 1831.
Lophobdella, Poirier et Rochburne, 1884. *Type: *L. quatrefagesi*, Poirier et Rochburne, 1884.
Lumbricobdella, Kennel, 1886. Type: *L. schæfferi*, Kennel, 1886.
Macrobdella, Philippi, 1872. *Type: *M. valdiviana*, Philippi, 1872.
Macrobdella, Verrill, 1872. *Type: *Hirudo decora*, Savigny, 1820.
Mesobdella, Blanchard, 1893. *Type: *H. gemmata*, Blanchard, 1893.
Microbdella, Blainville, 1845. (Original not found.)
Microbdella, Moore, 1900. Type: *M. biannulata*, Moore, 1900.
Mimobdella, Blanchard, 1897. Type: ? *M. japonica* or *M. buttkoferi*, n. spp., Blanchard, 1897.
Myzobdella, Leidy, 1851. *Type: *M. lugubris*, Leidy, 1851.
Nephelis, Savigny, 1820. †Type: *Hirudo vulgaris*, Müller, 1774.
Nephelopsis, Verrill, 1872. *Type: *N. obscura*, Verrill, 1872.
Notostomum, Levinsen, 1881. *Type: *N. læve*, Levinsen, 1881.
Ophibdella, v. Beneden et Hesse, 1863. *Type: *O. labracis*, v. Beneden et Hesse, 1863.

- Orobiddella*, Oka, 1895. Type: *O. whitmani* (probably), or *O. iijimai*, *O. octonaria*, n. spp., Oka, 1895.
- Oxyptychus*, Grube, 1848. Type: *O. striatus*, Grube, 1848.
- Oxytonostoma*, Malm, 1863. Type: *O. typica*, Malm, 1863.
- Ozobanchus*, Quatrefages, 1852. ?Type: *O. branchiatus*.
- Pachybdella*, Diesing, 1850. Type: *P. rathkei*, Diesing, 1850.
- Pæcilobdella*, Blanchard, 1893. †Type: *Hirudo granulosa*, Savigny, 1820 (subgenus of *Limnatis*).
- Palæobdella*, Blainville, 1828. Type: *Hirudo nilotica*, Savigny, 1820.
- Philæmon*, R. Blanchard. (Original not found.)
- Philobdella*, Verrill, 1872. Type: *P. floridana*, Verrill, 1872.
- Phormio*, Goldfuss et Schinz, 1820. Type: *Hirudo muricata*, Linnæus, 1767.
- Phytobdella*, Blanchard, 1892. *Type: *P. meyeri*, Blanchard, 1892.
- Pinacobdella*, Diesing, 1850. *Type: *P. kolenatti*, Diesing, 1850.
- Piscicola*, Blainville, 1828. Type: *Hirudo piscium*, Müller.
- Placobdella*, Blanchard, 1893. ?Type: *P. raboti*, Blanchard, 1893.
- Planobdella*, Blanchard, 1892. Type: *P. modesta*, Blanchard, 1892.
- Platybdella*, Malm, 1863. ?Type: *P. sexoculata*, Malm, 1863.
- Podobdella*, Diesing, 1850. *Type: *P. endlicheri*, Diesing, 1850.
- Pontobdella*, Leach, 1815. Type: *P. verrucata*, Leach, 1815.
- Praobdella*, Blanchard, 1896. Type: *P. büttneri*, Blanchard, 1896.
- Protoclepsine*, Moore, 1898. *Type: *P. sexoculata*, Moore, 1898.
- Protoclepsis*, Livanow, 1902. *Type: *Hirudo tessellata*, Müller, 1774.
- Pseudobdella*, Blainville, 1827. Type: *Hæmopsis nigra*, Savigny, 1820.
- Pseudobranchellion*, Apathy, 1890. *Type: *P. margoï*, Apathy, 1890.
- Saccobdella*, v. Beneden et Hesse, 1865. Type: *S. nebalia*, v. Beneden et Hesse, 1865.
- Salifa*, Blanchard, 1897. *Type: *S. perspicax*, Blanchard, 1897.
- Sanguisuga*, Savigny, 1820. Type: *Hirudo medicinalis*, Linnæus, 1767.
- Scaptobdella*, Blanchard, 1897. *Type: *S. horsti*, Blanchard, 1897.
- Schlegelia*, Wegenberg, 1877. (Type: *S. nepheloides*, Wegenberg, 1877), preocc. 1864.

Scorpenobdella, Saint-Loup, 1886. Type: *S. elegans*, Saint-Loup, 1886.

Semiscolex, Kinberg, 1866. †Type: *S. juvenalis*, Kinberg, 1866.

Semilageneta, Goddard, 1908. *Type: *S. hilli*, Goddard, 1908.

Theromyzon, Philippi, 1867. *Type: *T. pallens*, Philippi, 1867.

Torix, Blanchard, 1898. Type: *T. mirus*, Blanchard, 1898.

Trachelobdella, Diesing, 1850. Type: *T. mülleri*, Diesing, 1850.

Trochetia, Dutrochet, 1817. *Type: *T. subviridis*, Dutrochet, 1817.

Typhlobdella, Diesing, 1850. Type: *T. kovatsi*, Diesing, 1850.

Whitmania, Blanchard, 1887. Type: *Leptostoma pigrum*, Whitman, 1886 (for *Leptostoma*, preocc.).

Xerobdella, Frauenfeld, 1868. *Type: *X. lecomtei*, Frauenfeld, 1868.

The following generic names are not included in the lists published by Scudder ('Nomenclator Zoologicus'), the 'Zoological Record' (Index, 1880-1900):—

Archeobdella, *Astacobdella*, *Chthonobdella*, *Dermobdella*, *Dina*, *Eubbranchella*, *Gnatho*, *Hæmadipsa*, *Microbdella*, *Notostomum*, *Whitmania*, *Xerobdella*.

ON THE HYMENOPTEROUS PARASITES OF RHYNCHOTA.

BY CLAUDE MORLEY, F.E.S., F.Z.S.

(Concluded from p. 347.)

95. *Aphis papaveris*, Fabr.

From an *Aphis* on *Papaver somniferum*, Giraud bred (Ann. Soc. Fr. 1877, pp. 415-427) *Praon volucre*, Hal., *Trioxya auctus*, Hal., *Allotria castanea*, Htg., *Encyrtus atheas*, Walk., *Pachyneuron aphidiphagus*, Ratz., *Isocrates æneus*, Nees, and *I. vulgaris*, Walk. Reinhardt, however, bred quite different insects from *Aphis papaveris* (Berl. Ent. Zeit. 1857, p. 77; l. c. 1858, p. 12; et Stett. Ent. Zeit. 1859, pp. 194-6), since these were *Pachycrepis clavata*, Walk., *Aphelinus flavicornis*, Först., *A. tibialis*, Nees, and *Tetrastichus diaphantus*, Walk. (cf. Gaulle, Cat. 103-107).

96. *Aphis cardui*, Linn.

Aphidius cardui, Marsh. (Bracon. d'Europ. iii. 594) was bred by Bignell in Devon very commonly from this species in the middle of July, while of *A. cirsii*, Hal., he bred but one, in June, and it is to this species that Marshall is of opinion (l. c. 589) Buckton refers as the commoner parasite. From an *Aphis* feeding on *Carduus nutans* Kieffer records his new *Lygocerus antennalis*, var. *subserratus*.

97. *Aphis instabilis*, Buck.

Only Bignell has recorded (Trans. Devon. Ass. 1901, p. 690) the presence of parasites upon this species; he bred *Aphidius cirsii*, Hal., from it in South Devon, on June 13th, 1883.

98. *Aphis sambuci*, Linn.

Gaulle tells us that the Cynipid, *Allotria circumscripta*, Htg., has been bred from this species, which is said to be common in Britain (cf. Cat. 26). I took it at Cosham, Hants, July, 1909.

99. *Aphis myosotidis*, Koch.

Three direct parasites have been bred from this species by Bignell in Devon. The commonest probably is *Aphidius avenæ*, Hal., with its hyperparasitic *Allotria cursor*, since he bred but two of each sex of *A. matricariæ*, Hal., on Oct. 22nd, 1884, and but once, on the same date, *A. polygoni*, Marsh. (cf. Br. d'Europ. ii. 572, 592, 603).

100. *Aphis amygdali*, Fonsc.

The figure of Buckton's inadequately described *Cynips atriceps* (Mon. Aph. ii. 106 et 150, pl. lxxiii. fig. inf.), which he bred from this *Aphis*, clearly shows it to be a Cynipid and no "*Diplolepis*," to which, believing it a genus of *Proctotrypidæ* (!), he wished later (ii. addenda) to ascribe it. Cameron was unable to interpret it, and I have failed to find the type in Buckton's collection, now in the British Museum; but a study of the figure leads me to believe it an "artistically" drawn female of *Allotria minuta*, Htg.

101. *Aphis aparines*, Kalt.†

Allotria posticus, Htg., was bred from an Aphid under this name by Kirchner (Cat. 31).

102. *Aphis euphorbiæ*, Koch.

From Aphides on *Euphorbia paralias*, supposed by Marshall to be this species which is not mentioned as British by Buckton, Bignell bred two males of the new *Aphidius euphorbiæ*, Marsh., on July 4th, 1885.

103. *Aphis crithmi*, ? auct.

Bignell bred *Aphidius crithmi*, Marsh., from this species in

† It is not now known to which of our *Aphidiinæ* such aphidiphagous species as *Ichneumon aparines*, Schr., *I. dipsaci*, Schr. (employed by Giraud), and *I. aphidiphagus*, Schr. (F. B. ii. 308, Bavaria), *I. aphidum*, Linn. (F. S. 1643, misplaced by Spinola and restored by Fallen to the *Aphidiinæ*), or *Cryptus aphidum*, Fab., may belong. It was, I believe, Van Leeuwenhoek who first noticed Hymenopterous parasites upon *Aphididæ* in his 'Arcana Naturæ' in 1695. Frisch, Cestoni, and De Geer first gave accurate accounts of their metamorphoses. *Ichneumon aphidum*, L., is synonymised by Haliday, with some doubt, with his *Aphidius cirsii* (Ent. Mag. 1835, p. 101), and Westwood (Introd. ii. 132) refers the "*Cinips de l'Ichneumon des Pucerons*" of Geoffroy (ii. 305) to the *Chalcididæ*.

Devon on July 2nd, 1884, and *A. lonicerae*, Marsh., from it on the following day (Trans. Devon. Ass. 1901, p. 689).

104. *Aphis pteridis*, ? auct.*

From an Aphid under this name Dalla Torre (Cat. iii.) tells us that Reinhard has bred *Aphelinus euthria*, Walk.

105. *Aphis medicaginis*, ? auct.*

Three parasites, all apparently indirect, are said by Kieffer to attack this species, or, more correctly, his *Lygocerus aphidum* and *L. subtruncatus* are recorded from an aphid on *Medicago sativa*, which we may suppose to belong here. The other Cynipid is *Alloxysta scutellata*, Kief.

106. *Aphis monardæ*, ? auct.*

Howard tells us in his 'Revision of the *Aphelinæ* of North America' (p. 24) that an *Aphis* of this name is attacked by *Aphelinus mali*, Hald.

107. *Aphis primulae*, ? auct.

Both Dourst† and Gaulle (Cat. 87) record *Aphidius rufus*, Gour., as parasitic upon this species, which is not indicated by Buckton, though probably the same as that mentioned by Newman (Ent. Mag. 1836, p. 208) as inhabiting the cowslip, but not primrose.

108. *Hyalopterus pruni*, Fabr.

His *Macrostigma aphidum* is recorded from this species by Rondani (Bull. Soc. Ent. Ital. 1874, p. 134 et l. c. 1877, p. 184).

109. *Hyalopterus arundinis*, Fabr.

His *Lygocerus antennalis* has been mentioned by Kieffer as preying upon *Aphis arundinis* (André, Spp. Hym. Europ.).

110. *Chaitophorus populi*, Linn.

The only known parasite of this common species is *Hypsicamara ratzeburgi*, as given by Reinhard (Stett. Ent. Zeit. 1859, p. 195).

† Goureau's breeding of *Aphidius rufus* was, I believe, first published by Dours (Cat. Hym. France, 1874, p. 81), and he ascribes the parasite to Förster. Dours' hosts are so unreliable as a whole, however, and have recently been so thoroughly revised by my friend M. de Gaulle, that I have not troubled to examine his work, mainly culled from Goureau in this respect, very closely.

111. *Chaitophorus aceris*, Linn.

Haliday described (Ent. Mag. 1833, p. 490) his *Trioxyx aceris*, of which he says, "Prodiit mihi ex Aphidibus Aceris Pseudoplatani Julio mense," from the same specimen as is figured and described by Curtis (B. E. pl. et fol. 383) under the name *Aphidius cirsii*, through the latter erroneously supposing it to have been bred from an aphid on *Cirsium* (*Carduus*) *arvense*. Curtis's name should, however, be restored, on account of its two years' priority. *Aphidius restrictus*, Nees, and *A. rosæ*, Hal., are also given as preying upon this species by Gaulle (Cat. 87). Ratzeburg's *Chrysolampus* (*Sphegigaster*) *aphidiphagus* is probably a hyperparasite; he says of it (Ichn. d. Forst. i. 181 et ii. 184), "Später hat Hr. Bouché dasselbe Thier aus *Aphis Aceris* erzogen." Buckton gives (Mon. Aph. ii. 125) a remarkable account of receiving two oviparous females of this species from Montpellier, which had deposited three apparently normal eggs *en route*; the latter were left exposed, and the following morning were found to consist merely of shrivelled membranes. Their parents had already been parasitised by a species of *Aphidius*, and Buckton suggests that the latter's larvæ had penetrated the eggs within the Aphides' bodies. He, however, thinks that the parasites may have been *Pteromali*, one species of which, *P. ovulorum*, Först. (given at l. c. 154, though not associated), is known to lay its eggs within those of Aphids; and of it Buckton says: "The parasitic egg afterwards discloses the young grub, which attacks the aphid hardly older than itself." But I have never heard of an egg, containing a Hymenopterous parasite, attaining the larval state. Surely the mere pressure of a foreign substance within the host-egg, to say nothing of its ruptured shell, would preclude development; and certainly the whole account requires confirmation.

112. *Pterocomma pilosa*, Buck.

Six females of *Aphidius pterocommæ*, Marsh. (Bracon. d'Europ. ii. 579), were bred in Devonshire on June 24th, 1889, by Bignell from this species.

113. *Cryptosiphum gallarum*, Kalt.

Allotria victrix, Westw., and Kieffer's new *A. orthocera* are said by Gaulle to have been raised from this species (Cat. 26, 27).

114. *Callipterus betularius*, Kalt.

Marshall knew but a single female of his *Trioxya betulæ*, and this had been bred from the present host by Bignell in Devonshire (Bracon. d'Europ. ii. 554).

115. *Callipterus coryli*, Goet.

The Chalcid, *Myina flava*, is said by Buckton (Mon. Aph. ii. 156 et iii. 18) to oviposit freely in the larvæ of both this and the following species. Cameron (Phyt. Hym. iii. 2331, following Kaltenbach) records *Allotria brachyptera*, Htg., from an Aphid on *Fraxinus*, which is probably referable to the present species, since it is the only one mentioned by Buckton as feeding on ash.

116. *Callipterus quercus*, Kalt.

The common and polyphagous *Praon volucre*, Hal., is said by Marsh. (Bracon. d'Europ. ii. 540) to prey upon this common species, together probably with its hyperparasites, *Allotria ullrichi*, *Isocrates vulgaris*, and *Lamprotati*. Bignell also bred in Devon the unique specimen of *Aphidius callipteri*, Marsh. (l. c. 610) from this host. Giraud bred his *Tetrastichus aphidum* from an "*Aphis sur Quercus*" (Ann. Soc. Fr. 1877, p. 432), and *Myina flava* also attacks it, as noticed under the last species.

117. *Pterocallis alni*, Fabr.

This abundant species is said by Kieffer to be parasitised by his new *Alloxysta transiens*.

118. *Pterocallis juglandicola*, Kalt.

In the middle of September, 1907, at Sibton Abbey in Suffolk, I took a large winged female of this species, whose dead body was attached to the cocoon of an already emerged species of *Praon*.

119. *Pterocallis tiliæ*, Linn.

Praon flavinode, Hal., a rare species with us and unknown on the Continent, has been bred from this species in Devonshire by Bignell on Oct. 1st, 1883 (Trans. Devon. Ass. 1901, p. 688); its hyperparasites may be Kieffer's new *Allotria albipes*, which he records from *Aphis tiliæ*, and the Chalcid, *Myina flava*, of whose parasitism upon the present host Buckton (Mon. Aph. iii. 18) was doubtful.

120. LACHNUS.

Giraud gives two parasites, *Allotria forticornis*, Gir., and *Megaspilus fuscipes*, Nees, as preying respectively upon the Aphids of *Pinus pumilio*, and, according to Perris, on those of *P. maritimus*. These probably belonged to this genus (cf. Ann. Soc. Fr. 1877, pp. 416, 434).

121. *Lachnus pini*, Linn.

Aphidius pini, Hal., has been bred from this species on *Abies excelsa* by Bignell in Devonshire on Feb. 16th, 1886, the host of which had been captured during the preceding September, and possibly a different one of the same genus on *Pinus sylvestris* and *Abies larix* by Haliday (Marsh. Bracon. d'Europ. ii. 567). Marshall's unique female of his *Aphidius abietis* was also bred by Bignell ten days after capturing the host on *Abies excelsa* in Cann Woods, Devon, on Aug. 6th, 1886 (l. c. 566). *A. (Cælonotus) pictus*, Hal., is also recorded from this species by Gaulle (Cat. 86), as is *Notanisus versicolor*, Walk. (p. 96). Kirchner (Cat. 30) tells us *Allotria circumscripta*, Htg., has been bred from *Aphis pini*, Klt.

122. *Lachnus australis*, Ashm.*

Ashmead has described three parasites upon this American species: *Lygocerus (Chirocerus) floridanus* (Trans. Amer. Ent. Soc. 1881, Proc. p. xxxiv.), *Encyrtus lachni* (l. c. 1885, p. xvi.), and *Pachycrepis lachni* (l. c. 1887, p. 193).

123. *Stomaphis quercus*, Linn.

In describing his *Aphidius wissmannii*, Ratzeburg says (Ichn. d. Först. ii. 59): "Hrn. Wissmann verdanken wir die Entdeckung des schönen Insectes. Er erzog es in Menge aus *Aphis (Lachnus) quercus*. Die daneben befindlichen aufgeblähten braungrauen Blattläuse haben die Dicke eines Hanfkorns." This was in Hanover.

124. *Schizoneura lanigera*, Hausm.

The only known parasite of this most injurious species is *Aphelinus mali*, Halde., as recorded by Howard (Revis. Aphel. N. Amer. 24).

125. *Schizoneura ulmi*, Linn.

Both sexes of *Aphidius ulmi*, Marsh., have been bred from this species in Devon by Bignell on June 20th, 1884 (Bracon. d'Europ. ii. 577), and *Praon exoletus*, Nees, is also said to prey on it by Gaulle (Cat. 86). The Chalcid, *Decatoma biguttata*, Swed., var. *variegata*, Curt., has been indicated by Dalla Torre (Cat. v. 327) to have been recorded by Rondani, with no reference, from *Aphis ulmi*, which is the only Hemipteron there intimated, among a dozen *Cynipidæ*.

126. *Schizoneura aquatica*, ? auct.*

Encyrtus schizoneuræ has been described from this species by Ashmead (Proc. Amer. Ent. Soc. 1885, p. xvi.).

127. *Pemphigus bursarius*, Htg.

Buckton (Mon. Aph. iii. 119) says that this species is preyed upon by an undetermined "aphidiphagous ichneumon."

128. *Pemphigus filaginis*, Fonsc.

Allotria longicornis, Htg., was bred from *Pemphigus gnaphalii*, Klt., by Kirchner (Cat. 31), and Cameron (Phyt. Hym. iii. 233) tells us that Hartig bred the same hyperparasite from—(?) an Aphid concealed in—galls of *Nematus gallicola* (*Pontania proxima*, Lep.).

129. *Pemphigus bumeliæ*, Schr.

This British (cf. E. M. M. 1898, p. 6) species is given by Cameron (Phyt. Hym. iii. 233), upon Kaltenbach's authority, as one of the hosts of *Allotria* (*Pezophycta*) *brachyptera*, Htg.

130. *Pemphigus fraxinifolia*, ? auct.* 131. *Glyphina eragrostidis*, ? auct.*

In America, Howard (Revis. Aphel. N. Amer. 24) says these species are attacked by *Aphelinus mali*, Halde.

132. CHERMES.

Howard tells us (l. c. p. 38) that an American species of this genus is destroyed by *Coccophagus scutatus*, Howd. The insects given under this genus by Giraud belong to the *Coccidæ*.

133. *Chermes corticalis*, Kalt.

Probably both the *Chermes piceæ*, from which Ratzeburg records his *Pteromalus coccorum*, and the *Chermes strobi*, from Zool. 4th ser. vol. XIII., November, 1909.

which he bred *Tridymus aphidum* (Ichn. d. Först. ii. 183 et 197), were Coccids; or, if Aphids, were synonymous with *C. corticalis*, Kalt.

134. *Chermes abietis*, Linn.

Gaulle (Cat. 98) records the Chalcid, *Encyrtus scaurus*, Walk., from *Physokermes abietis*.

135. *Chermes laricis*, Htg.

His *Aphidius laricis* was first bred by Haliday from an Aphid on *Larix europæa*, and probably of the present species; he says of it, "Habitat in Larice e cujus Aphidibus prodiit mihi" (Ent. Mag. 1835, p. 97). It has not again been bred in Britain, but the same host is doubtless referred to by Giraud, who says (Ann. Soc. Fr. 1877, p. 416) that he raised both *Aphidius pini*, Hal., and *A. laricis*, Hal., from an Aphid on *Pinus larix*; and, from apparently the same species of host, he also bred (*l.c.* p. 434) his *Megaspilus laricis*. Gaulle (Cat. 113) records the Proctotrypid, *Lagynodes pallidus*, Boh., from *Chermes laricis*.

136. *Chermes bauhini*, ? auct.*

A Chalcid, *Psilophrys* (*Encyrtus*) *longicornis*, Walk., is recorded (Cat. 98) by Gaulle from this species.

137. *Phylloxera caryæ-scissa*, Riley.*

From this Floridan species Ashmead (Trans. Amer. Ent. Soc. 1881, Proc. p. xxx. et 1894, p. 328) records the emergence of his *Phylloxeroxenus phylloxeræ*.

138. *Tychea phaseoli*, Pass.

Bignell bred *Praon abjectum*, Hal., from this species in Devonshire on July 23rd, 1883 (Marsh. Bracon. d'Europ. ii. 534), together with the abundant *Aphidius ervi*, Hal., and probably the latter's hyperparasite, *Isocrates æneus*, Nees.

139. *Rhizobius pilosellæ*, ? auct.*

The only mention I find of parasites upon this species is in Gaulle's 'Catalogue' (p. 103), where the Chalcid, *Asaphes vulgaris*, Walk., is said to prey upon it.

140. UNDETERMINED APHIDIDÆ.

From the following list of parasites, which have been recorded from unidentified members of this family, I have omitted all

such as have hitherto been mentioned, since they may be supposed to have been bred from the same species, and in any case their repetition is valueless. The Aphids on *Ervum hirsutum*, however, whence Haliday first bred his *Ephedrus lacertosus* and *Aphidius ervi*, can hardly have been *Myzus cerasi*; he says of the former (Ent. Mag. 1883, p. 486): "Habitat, in agris passim Aphides Ervi forsitan et alias pungens. . . . In oviposition it carries the abdomen like the genuine *Aphidii*, but pierces the back of the Puceron, for which the slight inclination of the borer seems adapted, and the contact is less instantaneous, being often prolonged for several seconds." *Trioxys minutus*, Haliday, was first bred by him from Aphids on *Buxus balearica*. He also raised his *Aphidius salicis* from a species of Aphid on several different kinds of willow in July and August, along with the hyperparasites, *Allotria fulviceps*, Curt., and another species of the same genus. Curtis (Farm Ins. 75) says that Mr. T. Carpenter bred a *Cynips*, doubtfully referred to *C. quercus-inferus*, Linn., "from small Aphides"; Curtis describes this *Allotria* in Morton's 'Cyclopædia of Agriculture' (2 vols., London, 1855), but Cameron (Phyt. Hym. iii. 260) failed to recognise it. Rondani records (Bull. Soc. Ent. Ital. 1877, p. 199) *Telenomus truncatus*, Nees—his *Teleas linnæi*—from Aphids, but the association appears to be doubtful, since it has also been bred from *Bombyces*. All the other direct parasites not assigned to specific hosts are, I think, comprised in Marshall's Bracon. d'Europ. ii. pp. 540, 574, 582, 589, 591), and in Giraud's "Liste des éclosions d'Insectes" (Ann. Soc. France, 1877, pp. 415-6 et 427).

Buckton gives (Mon. Aph. ii. 154) a list of aphidiphagous Hymenoptera, upon Dr. Reinhard's authority, which comprises *Agonioneurus flavicornis*, Först., and *A. subflavescens*, Westw., *Callimome auratus*, Fourc. (probably in errore), *Mesosela elongata*, Walk., *Myina chaonia*, Walk., *Pteromalus aphidivorus*, Först., and *Spalangia nigra*, Latr. And Bignell (Trans. Devon. Assoc. 1901, p. 692) indicates *Allotria perplexa*, Cam., *A. basimaculata*, Cam., *A. ancylocera*, Cam., *A. tscheki*, Gir., *A. longicornis*, Htg., and *Lygocerus serricornis*, Boh., as having been bred by himself in Devonshire from unspecified Aphides, through doubtful direct parasites.

ADDENDA.

There are a few American species of Rhynchota, with whose classified position I was not sufficiently familiar to place them in the body of my paper; thanks to Mr. A. Butler and the Editor, however, I am now enabled to refer them to their approximate situations.†

Brochymena arborea, Say.*

Trissolcus brochymenæ is given as preying upon this species, of whose position I am still uncertain (though *Brochymena* is a genus of Pentatomids), by Ashmead (Florida Agric. 1881, p. 193).

Euschistus servus, Say.*

From this Pentatomid, Ashmead has recorded (Bull. U. S. Nat. Mus. 1893, p. 162) his Proctotrypid *Trissolcus euschisti*.

Murgantia histrionica, Hahn.*

This is another Pentatomid, from which the same author (*loc. cit.* p. 163) records his *Trissolcus murgantiæ*.

Acanthocerus galeator, Fabr.*

Some doubt exists respecting the parasitism of *Hadronotus rugosus*, How., upon this Coreid, as given by Ashmead (*l. c.*, p. 232).

Acanthocephala femorata, Fabr.*

This Coreid is destroyed by *Hadronotus floridanus*, Ashm. (Amer. Entom. 1887, p. 148; cf. also D. T. Cat. v. 498).

Anasa tristis, De G.*

Two species of the Proctotrypid genus *Hadronotus* attack this Coreid; *H. anasæ* is reported from it by Ashmead (Bull. Ent. U. S. Dept. Agric. 1887, p. 23), and Dalla Torre tells us (Cat. v. 498-9) that Riley and Howard have raised both this species and *H. rugosus*, How.

† It is not within my province to investigate the error which led Dalla Torre to insert (Cat. v. 67) *Misocampus nigricornis* as the Rhynchotal host of *Eulophus verbasci*. It is, of course, itself a Chalcid of the genus *Torymus* as placed by D. T. himself (*lib. cit.* 310). That notice should be drawn, however, is necessary, since the statement is copied by de Gaulle (Cat. Hym. France, 109).

Largus succinctus, Say.*

From a species of this Pyrrhocorid genus, under the above name, has been described his *Hadronotus largi* by Ashmead (Bull. U. S. Nat. Mus. 1893, p. 231).

Dysdercus suturellus, Herr.-Sch.*

The well-known Pyrrhocorid, the "Cotton Stainer Bug," is also said by Howard ('Insect Life,' 1888, p. 242) to fall a victim to *Hadronotus rugosus*.

Zelus bilobus, Say.*

This Reduviid is said to be preyed upon by *Hadronotus leptocorisæ*, How. (Hubbard, 'Orange Insects,' 1885, 215).

Zelus longipes, Linn.*

A Chalcid, *Eupelmus zeli*, has been described from this species by Ashmead (Trans. Amer. Ent. Soc. 1886, p. 130).

Ceresa bubulus, Say.*

Ashmead gives (Canadian Entom. 1888, p. 107) the Chalcid *Trichogramma ceresarum* as attacking this Membracid.

NOTES AND QUERIES.

A V E S.

Household Visits by Sand-Martins and Swallows.—Knowing that you always take the greatest delight in hearing anything about your little friends in "bird-life," I thought I would let you know of an interesting incident which happened to me on Thursday night (Oct. 28th). I reside in the country near Weybridge, and as much as possible live in the open air, sleeping with both my windows wide-open. On going to bed on that night, accompanied by my black spaniel "Nibs," who always sleeps at the foot of my bed, I noticed, after lighting the gas, the dog gazing intently at a picture on the wall, and also heard a little twittering. I then saw that perched on the picture-frame were two little Sand-Martins, huddled up close together for warmth, the poor little birds being very cold and miserable. I put my hand up and took them off, and after having warmed them up a little I put them back again on their perch. On waking in the morning the first thing I saw was one of them flying round the room, and to my astonishment it pitched down on my dog's back, and there started to plume itself. Good old "Nibs" just glanced at it, wagged

his tail, and went to sleep again, while the bird, evidently attracted by the warmth of the dog's body, crept down and nestled close up under his shoulder. It was quite a pretty sight, but, as I thought the other little bird ought not to be left in the cold, I tumbled out of bed and took the wee mite into my warm hands, where it was quite happy, and twittered away gaily. After a while I took the other little chap away from "Nibs," and put the two of them on the window-sill, where, after pluming themselves for a time, and chirruping a thankful farewell, away they went. I hope they had a safe passage to a more genial clime.

Some years ago, at Bexhill-on-Sea, and in the early autumn, I had my bedroom invaded by a horde of Swallows, every conceivable perch being occupied, and the birds roosting several deep on the dressing-table, &c. As you may imagine, they were all welcome guests, and I took the greatest care not to needlessly disturb my little friends. In the morning I had a busy time assisting them to find their way out, a considerable number having become jammed in the window-sashes, &c. However, at last all were safely despatched on their long journey.—A. E. DARLING (32, Harrington Road, Queen's Gate, S.W.).

Sooty Tern near Barmouth.—I presume the occurrence of the Sooty Tern (*Sterna fuliginosa*) in Britain is sufficiently rare to be noted and put on record. I see that Seebohm gives two instances, and Howard Saunders enumerates three of its captures, but am not aware whether others have been obtained since. I thought it would be of interest to ornithologists to know that a specimen was picked up within about a mile or so of Barmouth on August 17th last, and brought to me as "a *Petrel*"! I say "picked up" rather than "knocked down" (though the bird was alive), to prevent it being remarked that "it is a great pity this rare species was thus ruthlessly destroyed, as if it had been spared it would probably have remained to breed on our shores"! as has been said of birds quite as unfitted for nesting in Britain. It was in fair plumage, though the sixth and three next primaries and the outermost tail-feathers seem recently moulted, being more ash-coloured and fresher-looking than the rest of the plumage. The middle toe-nails are long, and have an inward lateral curve, as though bent from long standing on an unyielding ground. It weighed five ounces, and measured in length 16 in. Breadth, wings expanded, 22½ in. On dissection it proved to be not at all emaciated, though rather thin and without any subcutaneous fat. The stomach contained small sand-eels, some fresh, others partially digested. It was a male. The bird has been mounted, and is still in my possession.—F. C. RAWLINGS (Barmouth).

NOTICES OF NEW BOOKS.

The Cambridge Natural History. Vol. IV. By GEOFFREY SMITH, M.A.; HENRY WOODS, M.A.; A. E. SHIPLEY, M.A., F.R.S.; CECIL WARBURTON, M.A.; and Prof. D'ARCY W. THOMPSON, C.B., M.A., &c. Macmillan & Co., Limited.

By the issue of the present volume a notable publication has been completed, and the Editors, Dr. Harmer and Mr. Shipley, are to be congratulated on the successful termination of sixteen years' labour in promoting the knowledge of authoritative zoology, for; though "Natural History" is the title, animal life is the subject. The ten volumes which constitute and complete this series will be studied by students, consulted by specialists for information outside their more limited survey, and afford a referential refuge for the something more than general reader.

The subject of Crustacea, originally undertaken by the late Prof. W. F. R. Weldon, and of which we read the "chapter on the Branchiopoda is all he actually left ready for publication," has been with that exception written by Mr. Geoffrey Smith, and forms the first section of the volume. Mr. Henry Woods has written on the Trilobites and Eurypterida; Mr. Shipley has given an Introduction to Arachnida and King-crabs, and described the Tardigrada and Pentastomida; the Scorpions, Spiders, Mites, Ticks, &c., are dealt with by Mr. Warburton; and Prof. D'Arcy Thompson is the authority for the Pycnogonida. It will thus be seen that the volume is the work of specialists, and if criticised it must be from the pens of specialists.

The present volume, like its predecessors, is a truly biological publication, though not restricted to that particular study of animal life; many bionomic facts have been compiled, and the references to the works and records of other naturalists are of no inconsiderable assistance, especially to those who cannot be specialists in all orders. One remark by the writer on Crustacea (Paguridea) reflects the biological standpoint; in his account of the Robber-crab (*Birgus latro*) he states, and truly, that, disregarding the legends attached to this creature, "the philosopher

may well find its structure more strange than fiction, and the consideration of its morphology an intellectual feast."

Egyptian Birds ; for the most part seen in the Nile Valley. By
CHARLES WHYMPER. Adam & Charles Black.

THE question is often asked as to the best plan for writing and publishing a book on the birds of some Continental or other favourite resort of visitors. In this volume Mr. Whympers has gone very far in answering that inquiry ; but, as he states in his "Foreword" : "The scientific man will find little that is new in these pages ; they are not meant for him—they are alone meant for the wayfaring man who, travelling this ancient Egypt, wishes to learn something of the birds he sees." Some fifty birds are selected, a very representative sample, and these form the subject of individual coloured plates, some of which are absolutely fascinating in fidelity and background. The above remarks are sufficient to explain that this volume is naturally outside works like those of Shelley or Von Heuglin on the same subject, and no comparison is intended, but it will nevertheless have a considerable ornithological importance if the book is taken up by Egyptian visitors, for it should have a recognition in Cairo. There are true lovers of birds who are in no sense ornithologists, and there are some ornithologists who in the true sense can scarcely be called lovers of birds ; in fact, it might as well be claimed that the hunting man is a lover of foxes or the angler a lover of fishes. To the first-named circle we commend this book.

There is an interesting though somewhat regrettable statement respecting the Senegal Sand-grouse (*Pterocles senegallus*). Capt. Shelley, in 1872, gave localities where they might be found, "and ever since he gave that information there has been each winter a regular invasion of British and other ardent sportsmen to each of the places named to have a little Sand-grouse shooting. Result : at those places there are now none whatever, and no one living there seems to know anything more about Sand-grouse than that annually large numbers of men come with shooting equipment ready to make record bags, and go away without firing a shot."

